

# Biohabitats

Incorporated

December 18, 1997

Mr. Richard R. Brush, Manager,  
Water Resources Section  
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Department of Permitting Services  
250 Hungerford Drive, Second Floor  
Rockville, Maryland 20850

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Ecological Assessments  
Ecological Planning  
Ecological Restoration

REF: **Clarksburg Town Center Phase I**  
**Department of Permitting Services Comments of December 11, 1997**  
**Preliminary Plan #: 1-95042**

Biohabitats Project #97004.01

SUBJ: **Response to Comments**

Dear Mr. Brush:

Enclosed is a point-by-point response to your review comments of December 11, 1997 on the review of the Final Water Quality Plan. We have enclosed revised pages of the Final Water Quality Plan for you to review.

## SEDIMENT CONTROL CONCEPT PLAN

No specific time of the year is better than another; however, late fall to early winter would be a better time to conduct construction activities because of reduced biologic activity in the stream.

### Section 2.2 #2 and 3.3.2

Reducing the drainage area by 50% would likely reduce the bankfull. Discharge and drainage area do not follow a 1:1 ratio; rather discharge will decrease at a slightly lower rate. Using the USGS regression curve for the Piedmont region<sup>1</sup>, we estimate that bankfull (approximated here by the 2 year discharge) will be reduced by 36%. This will likely lead to a reduction in channel capacity through a combination of bed aggradation and bar formation. For channel aggradation to take place, however, an upstream sediment source must exist. Sediment supply upstream is expected to decrease upon conversion of cultivated crop land to residential land use. Another possible upstream sediment source is the channel banks, but a reduction in the magnitude of "bankfull" flow events (through water diversion to Pond #2) will reduce the erosive and transport capacity of the stream, decreasing the likelihood of upstream bank erosion. Because of the lack of sediment supply, these channels will take decades perhaps 100's of years to adjust.

Ollow, J. A., 1995, "Technique for estimating magnitude and frequency of peak flows in  
Water-Resources Investigations, Report 95-4154, 55p.



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REF: Final Water Quality Plan for Clarksburg Town Center Phase I  
Preliminary Plan #: 1-95042  
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SUBJ: Response to Dept. of Permitting Services Comments of Dec. 11, 1997 (Cont.)

Section 3 Pg. 3-12

No action currently needed.

Section 3. Page 3-12

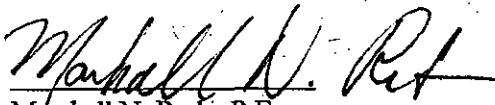
The BMP modeling has been revised as per the request of DEP. Doug Marshall and Ken Brown advised that the impervious value of 32.2% (obtained from the Traville Study) be replaced with an Rv of 0.20 for the purposes of the modeling effort. Revised BMP output sheets and summary sheets are enclosed with this submission as Appendix L and pages 3-12 thru 3-20.

Section 4.2

The monitoring schedule for sediment and erosion control has been revised as requested. A revised page 4-2 is enclosed with this submission.

If you have any questions or if I may be of further assistance please do not hesitate to contact me or Keith Bowers at (410) 337-3659.

Very truly yours,  
BIOHABITATS, INC.

  
Marshall N. Rudo, P.E.  
Project Engineer

enc.

cc: Richard Gee, Montgomery County Department of Permitting Services.  
cc: J. Keith Bowers, RLA, Principal, Biohabitats, Inc.

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Ecological Assessments  
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Ecological Restoration

**REF:** Clarksburg Town Center Phase I  
Department of Environmental Protection's Comments of December 9, 1997  
Preliminary Plan #: 1-95042

Biohabitats Project #97004.01

**SUBJ:** Response to Comments

Dear Mr. Brush:

Enclosed is a point-by-point response to your review comments of December 9, 1997 on the review of the Final Water Quality Plan. We have enclosed revised pages of the Final Water Quality Plan for you to review.

*1. The Performance goal for maintaining base flow is clearly stated on page 2-6 as a zero percent reduction in flow. However, later on the same page, it is stated that the proposed BMP's should provide 80% of the necessary subsurface flow to maintain baseflow. The resulting 20% reduction in baseflow is unacceptable and does not meet the performance goal for the CTC. Clearly state how the CTC site will meet the performance goal of a 0% reduction in baseflow in the FWQP.*

The apparent discrepancy has been corrected. There will be no reduction in baseflow once Clarksburg Town Center is developed. As summarized in Section 3.3.3 of the FWQP, development of Phase IA will recharge 128% of the existing baseflow volume while Phase IB will recharge 198% of the existing baseflow. The original 80% was based on a preliminary hydrogeologic investigation conducted by Schnabel Engineering prior to the final design and location of the BMPs. Schnabel Engineering has prepared a letter to revise their preliminary baseflow estimation. A copy of this letter is attached. Page 2-6 has been also been revised and is enclosed.

*2. Your pollutant reduction performance goals presented in Table 3.2.9 are not the BMP performance goals for the site. The figures presented in Table 3.2.4 as removal efficiencies are the performance goals for each BMP. Post-development BMP monitoring has been designed to determine these goals are met.*

As per our discussion with Ken Brown and Doug Marshall during the Public Information meeting on December 9, we have revised the performance goals of Table 3.2.9. These results are the literature values given for the pollutant removal capability of the various BMP's. Page 3-20 has been revised and is enclosed.

Page 1

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December 16, 1997

REF: Final Water Quality Plan for Monitoring of Clarksburg Town Center Phase I  
Preliminary Plan #: 1-95042  
Biohabitats Project #97004.01

SUBJ: Response to Dept. of Permitting Services Comments of Dec. 9, 1997 (Cont.)

3. *The use of 32.2% impervious for agricultural land remains undocumented (the Traville study is not adequate documentation) and is unacceptable. From the literature and discussions with other staff, a more accurate method of determining runoff coefficients from cropland is to use that presented in Pitt, 1987, Section 5, Small Stream Hydrology (Table 5.5 from this publication is attached). An average annual rain event will result in a runoff coefficient (Rv) of 0.20 for clay soils.*

*0.20 represents a conservative number as the channery silt loam soils on the site are not technically clay soils but, due to agricultural use, would have similar runoff characteristics. This is the value to use in the calculation of cropland runoff. The Rv that you are currently using represents the runoff coefficient for clay soils in a two year storm event and does not represent an average runoff condition for rainfall over a typical year.*

The BMP modeling has been recomputed using an Rv of 0.20 for agricultural land use. Appendix L has been revised along with pages 3-12 thru 3-20. These items are enclosed.

4. *Forest land may presently exist within some of the BMP drainage areas. Please document whether forested land exists within the BMP drainage areas and include the forested areas in the BMP model.*

Presently, the majority of forest areas within the Clarksburg Town Center site are found in the stream buffer. No development is proposed in these areas. Other forested areas consisting of small hedge rows comprise only a small portion of the drainage area to each BMP (for example, only 1.5 acres of forest cover is within the 22 acre drainage area to SF#6). In order to facilitate computations, an assumption of agricultural land use was employed for the entire drainage area.

5. *The water quality monitoring section must include the statement that all flow weighted sampling of BMPs at both the input and output locations is to be done using automated sampler. The automated sampler must be connected to, and work in conjunction with, a flow logger unit. Contact DEP staff for assistance.*

As requested, a note that all flow weighted sampling of BMP's is to be done with automated samplers connected to a flow logger unit has been added to the Final Water Quality Plan. A revised page 4-3 is enclosed.

6. *We have been told that our concerns about the flow logger deployment at Stringtown Road have been addressed (per verbal communication with Marshall Rudo, Biohabitats). DEP/SPA staff will inspect the flow logger in the next week to verify if it is deployed according to our specification.*

No action needed.

December 18, 1997

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7. The estimates of bankfull flow presented in the FWQP are not correct and need to be revised. MCDEP has a monumented, surveyed cross-section located below Stringtown Road and has calculated bankfull discharge at that site to be considerably lower (approximately 40-50 cfs) than that calculated for cross-section #7, located above Stringtown Road. Our bankfull estimate is also within the range predicted from regional curves (Leopold, 1993) and the values used on the stormwater computations by M/K Enterprises.

In addition, several of the cross-sections in the FWQP have bankfull flows decreasing in a downstream direction. This must also be corrected.

Prior to the submittal of the revised FWQP, we reviewed all bankfull indicators and calculations. Unfortunately these figures were not included in the revised report. Revised figures are included in this submission. Our revised bankfull discharge for cross section 7 (above Stringtown Road) is 142 cfs. This figure agrees well with MCDEP's downstream estimate.

The apparent systematic decrease in bankfull discharge on the eastern tributary is misleading. Cross section 8 was taken in a heavily entrenched section of river, where bankfull indicators were limited and difficult to discern. The bankfull discharge in this reach has probably been over estimated, but cannot be revised because there are no other bankfull indicators. Cross section 9 was revisited and a scour line slightly below the top of bank was chosen to represent bankfull. This new elevation corresponds to a bankfull discharge of 45 cfs, which is close to, but slightly lower than the two year discharge predicted from regional USGS regression equations<sup>1</sup>. Cross section 10 was also reviewed, however our bankfull indicators seem reasonable and no changes were made. With the above change, the discharge increases with increasing drainage area as expected. Revised cross-sections 7 and 9 are enclosed.

We revisited cross section 4, which has an anomalously low bankfull discharge. We are confident in our bankfull indicators, however the selection of this particular site for a cross section may not have been appropriate considering the possible backwater effect on bankfull discharge from the beaver dam downstream. Rather than "correct" this discharge, it is probably better to discard it. The classification is the same as the cross section immediately upstream (XS3) and downstream (XS5).

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<sup>1</sup> Leopold, J. A., 1995, "Technique for estimating magnitude and frequency of peak flows in Maryland", USGS Water-Resources Investigations, Report 95-4154, 55p.

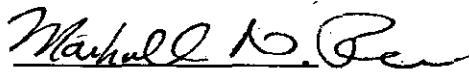
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BIOHABITATS, INC.



Marshall N. Rudo, P.E.  
Project Engineer

enc:

cc: J. Keith Bowers, RLA, Principal, Biohabitats, Inc.

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